REMARKS/ARGUMENTS

This paper is submitted responsive to the Office Action mailed May 15, 2007. Reconsideration of this application in light of the accompanying remarks and amendments is courteously solicited.

By the present response, formal amendments have been made to the specification and claims as requested by the Examiner. These amendments should not be considered to raise new issues as they are amendments and corrections which were themselves suggested by the Examiner.

The new replacement sheets of drawings likewise should not be viewed as raising new issues as they are merely better quality images of drawing corrections which have now been proposed for on three separate occasions.

Finally, the amendments to claim 9 dealing with equiangular being when the support is at rest, and dealing with the vertical support part extending from central portions of top and bottom edges of the vertical opening, are clearly not new issues, as they have been thoroughly discussed in the prior Office Action. Thus, consideration of this response and allowance of the application are respectfully solicited.

In the aforesaid action, the Examiner took the following steps, each of which is discussed below under a corresponding heading.

1. The Examiner requested that the Specification be brought in line with the claim language.

2. The Examiner objected to claims 11 and 12 and suggested claim amendments.

3. The Examiner rejected claim 9 as anticipated by Oh et al.

4. The Examiner rejected claims 9-10 as obvious over

Delafosse in view of Chun et al.

5. The Examiner rejected claims 11-12 as obvious over Oh et al. in view of De Mario et al.

6. The Examiner rejected claim 13 as obvious over Oh et al. in view of De Mario and Delafosse.

7. The Examiner rejected claim 14 as obvious over Oh et al. in view of De Mario and Nguyen.

8. The Examiner rejected claims 15-16 as obvious over Oh et al. in view of Mayet and Foulds, or in the alternative over Delafosse in view of Chun, Mayet and Foulds.

9. In the Response to Argument section, in addition to issues which are discussed above, the Examiner maintained a refusal to enter Figures 4 and 5a which were filed on October 24, 2005.

Each of these rejections will be discussed in the order listed.

1. The Specification

The Examiner requested that the specification be amended to make the term "intermediate unit strip" consistent. This is appreciated and the requested amendments to the specification have been made. No new matter is introduced by this amendment.

2. Objections to claims 11 and 12

The Examiner objected to certain language in claims 11 and 12 and suggested amendments to correct these matters. The suggested amendments are appreciated and have been made.

3. Claim 9 and Oh et al.

Claim 9 calls for the fuel rod support part (52) to be bent to have equiangular surface contact with a fuel rod supported by

the grid spring, and it is noted that the Examiner has applied Oh et al. from a standpoint that pressure between the rod and the flat surface of Oh et al. would inevitable lead to some deformation of the support of Oh et al., and that the deformed part would have equiangular angles with the supported surface of the rod.

It is noted that one aspect of the present invention is that the equiangular surface applies a desired uniform contact pressure distribution and reduces peak stress of the fuel rod support part (See specification at paragraph [0035]). This is very much different from the situation in the Examiner's interpretation of Oh et al. Specifically, the fuel rod support part of claim 9 is bent to have the equiangular surface contact. It is not merely deformed through contact, as that would result non-uniform contact pressure distribution, contrary to the teachings of paragraph [0035] of the present specification. In order to further highlight the structural difference between claim 9 and Oh et al., claim 9 has been amended to specify that the support part is bent to have equiangular surface contact with the fuel rod in a rest position. In other words, no deformation of the support part is needed in order to have the equiangular relationship between the support part and the rod. Thus, while it is believed that the claim as originally worded was sufficient to define over the art of record, the language added even further highlights the patentability of this claim over Oh et al.

4. Claims 9-10 and Delafosse in view of Chun et al.

Reconsideration of this rejection as it applies to claims 9-10 as amended is respectfully requested. Claim 9 has been amended to specify that the vertical support part (51) extends

vertically in the vertical opening (53) from central portions of top and bottom edges of the vertical opening. Although the Examiner expressed doubt as to whether Applicant could claim this subject matter based upon the present specification, this claim language is indeed properly disclosed and enabled by the present specification. The specification discloses a "vertical support part 51 comprising a single bridge extending vertically between the central portions of the top and bottom edges of the vertical opening 53" (See paragraph [0036]). It is submitted that this passage of the specification, along with the clear showing in the figures, establishes ample support for the amended claim language.

It is further submitted that the structure of claims 9-10 is very much different from anything disclosed or suggested by Delafosse or Chun et al. The Examiner asserts that bearing-arms 14 in Figure 5 of Delafosse are substantially the same as the vertical support part called for in the claims. It is pointed out that the bearing-arms 14 of Delafosse do not extend from the top and bottom edges of the vertical opening. The bearing-arms 14 of Delafosse are not supported by both edges of the vertical opening. Chun et al. likewise does not disclose a vertical support part extending vertically in the vertical opening. Reconsideration of this rejection is respectfully requested.

5. The Examiner rejected claims 11-12 as obvious over Oh et al. in view of De Mario et al.

Claims 11-12 depend from claim 9 and are believed to be patentable based upon this dependency and in their own right.

6. The Examiner rejected claim 13 as obvious over Oh et al. in view of De Mario and Delafosse.

Claim 13 and depends from claim 9. Claim 13 is submitted to be allowable based upon dependence from claim 9 and also in its own right.

7. The Examiner rejected claim 14 as obvious over Oh et al. in view of De Mario and Nguyen.

Claim 14 and depends from claim 9. Claim 14 is submitted to be allowable based upon dependence from claim 9 and also in its own right.

8. The Examiner rejected claims 15-16 as obvious over Oh et al. in view of Mayet and Foulds, or in the alternative over Delafosse in view of Chun, Mayet and Foulds.

Claims 15-16 are submitted to be allowable over the art of record. Claims 15-16 call for the vertical support part and the inner support part to be different in structure. The Examiner concedes that this is not taught in Oh et al., Delafosse or Chun.

The Examiner instead relies upon teachings from Mayet et al. and Foulds. Reconsideration of this rejection is earnestly solicited. The Examiner has laid out a complex reasoning for why it would be allegedly obvious to combine materials from Mayet et al in one region of the grid, and materials from Foulds in a different part of the grid. This rejection is not supportable for two separate reasons.

First, even if one did make this combination, to arrive at a grid with Zircaloy components in the inner area and steel components around the edge, this clearly does not meet the claimed subject matter.

In connection with claim 15, great detail is given in the claim to establish the specific structure referred to, and claim

15 ends by stating that the "vertical support part and the inner support part are different in structure". Nothing at all in the specification discusses using different materials in obtaining this different structure. Throughout the specification, the supports on the outer strips are structurally different, i.e., they have different shape and configuration, than the support part of the inner strips. This structural limitation is not met even by the combination asserted by the Examiner. Put another way, even if one did make a combination as suggested by the Examiner, with Zircaloy material constituting inner supports and steel constituting outer or perimeter supports, these supports could still be identical in structure, and according to all teachings of the art of record, there can be no other conclusion. None suggests in any way that a structurally different support be used in the inner versus the outer strips of the grid.

Second, it is also submitted that the actual teachings of the prior art cited by the Examiner would not lead a person skilled in the art to make any such combination, despite that fact that the combination does not meet the limitations of claim 15. For ease of reference, the actual teachings of the art of record as cited by the Examiner are set out below:

Mayet et al. column 1, lines 23-27 is as follows:

> The invention relates in particular to the straps of a grid in which the springs are integrally formed with the flat portion of each strap. At least in the portion of the assembly which is subjected to a high level of neutron flux, these straps are made of a zirconium based alloy such as Zircalloy 4.

DeMario column 7, lines 10-16 (9-16 actually presented) is

as follows:

> Each fuel rod 130 in turn comprises an elongate, hollow and generally cylindrical metal casing or cladding 140 for sealingly enclosing a plurality of generally cylindrical fuel pellets 150 capable of generating heat by nuclear fission. Cladding 140 has an inside diameter 160 and an outside diameter 170 and may be any suitable metal having a relatively small microscopic cross section for neutrons, such as "ZIRCALOY-4".

Foulds column 9, line 61 through column 10, line 8 is as follows:

> Two types of rods, both having an outside diameter of 0.422 in., are contemplated; namely, a first rod R-I having steel tubing, E = 29x10^6 psi, with 16.5 mil wall thickness and a second rod R-II having Zircaloy tubing, E = 11x10^6 psi, with 24 mil wall thickness.
>
> For a 20-inch span of the stainless steel tubing R-I:
>
> K_r32 75.3 lb/inch
>
> For a 20-inch span of the Zircaloy tubing R-II:
>
> K_r = 40.8 lb/inch
>
> If the support system is to be stiff enough for both types of fuel rods,
>
> K_g>T(75.3) lb/inch

The above passages are utterly devoid of any teaching or suggestion to provide supports on inner walls with a different structure than supports on outer walls.

Foulds discusses Zircaloy and steel in terms of its use in the rods, not the supports. The only mention of the support system is at the end, where is states that the support system

must be stiff enough for both types of fuel rods. This intuitively teaches against the present invention, teaching that even for a set of rods with different properties, instead of using support with different properties, one must utilize a support which is sufficient for both types of rods.

The alleged prior supplied by the Examiner by taking official notice are challenged as to their teachings, and further fail to cure the deficiencies noted above.

In connection with claim 16, absolutely nothing in the art of record discloses or suggests that the vertical support part should have a higher spring strength than the inner support part. The spring strength is of course set by more than just the material from which the structure is made, with parameters such as component thickness and shape making a substantial difference in this regard. Nothing at all in the art of record suggests any such difference, or that it would be desirable to have supports of higher spring strength along the perimeter as compared to those on inner strips.

Mayet discloses that certain materials (Zircaloy) are well suited to certain conditions. This teaching is far removed from the claimed different spring structures. Foulds discusses rods of different sizes. The combination of these diverse teachings is beyond that which would be done by a person of ordinary skill in the art, and even if such teachings were considered together by a person skilled in the art, these teachings fall far short of the requirements of claims 15-16.

In addition to the foregoing, claims 15 and 16 are also submitted to be allowable based upon their dependency from claim 9 and the remarks set forth above.

9. Drawing corrections

The Examiner maintained a refusal to enter drawing corrections related to Figures 4 and 5a, stating that these drawings were too dark for examination and/or publication. Replacement sheets of drawings have been enclosed and show these figures in better quality for examination and publication purposes. It is assumed that the remainder of the previously proposed drawing corrections have been accepted by the Examiner in light of no objection from the Examiner other than to Figures 4 and 5a. As to Figures 4 and 5a, these views are lighter and of better line quality than the replacement pages submitted previously. These replacement sheets do not introduce any new matter to the application. Acceptance of the drawings is respectfully requested.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is submitted that the claims as pending herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

If any fees are required in connection with this case, it is respectfully requested that they be charged to Deposit Account No. 02-0184.

Respectfully submitted,
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Date: October 15, 2007